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## Human papillomavirus DNA is present in a subset of unselected breast cancers.

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Liu Y, Klimberg VS, Andrews NR, Hicks CR, Peng H, Chiriva-Internati M, Henry-Tillman R, Hermonat PL.

Department of Obstetrics and Gynecology, University of Arkansas for Medical Sciences, Little Rock, Arkansas 72205, USA.

Related Resources

**OBJECTIVE:** The major molecular events in the genesis of most breast cancers are unknown. However, human papillomaviruses (HPV) have been reported to be found in a significant portion of breast cancers of women with concomitant cervical intraepithelial neoplasia III. To investigate a potential HPV-breast cancer link, we carried out a small survey to identify HPV in unselected, general breast cancer tissues. **STUDY DESIGN/METHODS:** Deoxyribonucleic acid (DNA) was isolated from 17 breast cancer tissues (and one cervical swab) taken from our local, randomly selected patient population. Two different previously characterized broad-spectrum primer sets (targeting the E6/E7 or L1 regions) were used to amplify HPV DNA, and another primer set was used to amplify the ColE1/pBR322 origin of replication by polymerase chain reaction amplification. The polymerase chain reaction product DNA was analyzed by dot blot hybridization with HPV-16, -18, -31, or pRB322 DNA probes. Total cellular DNA was also analyzed by one- and two-dimensional Southern blot analysis. Finally, the E6/E7 polymerase chain reaction products were cloned, sequenced, and compared to previously cloned HPV types. **RESULTS:** Polymerase chain reaction/dot blot analysis by both the HPV E6-E7 and L1 primer sets identified the same 6 out of 17 (35%) breast cancers as being HPV positive. ColE1/pBR322 origin targeted polymerase chain reaction/dot blot analysis failed to identify plasmid contamination. One- and two-dimensional Southern blot analysis showed that the breast cancers specimens contained significant levels of HPV DNA and that the viral DNA was largely episomal. The sequences of the HPV clones demonstrated that HPV-16, -18, and possibly type 11 were present within the breast cancer specimens. Furthermore, the HPV sequences cloned from the cervical swab and breast cancer of the same patient were

found to be identical. CONCLUSIONS: These data suggest that HPV may be associated with a significant subset of breast cancers, and further suggest that additional studies are warranted.

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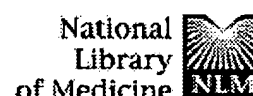
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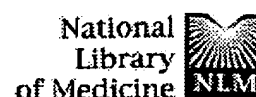
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